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INDUSTRIAL POLICY AND THE ENVIRONMENT: THE CASE OF THE MANUFACTURING SECTOR IN METRO CEBU, PHILIPPINES*

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INTRODUCTION

Industrial policies have been important tools in the quest for development in the Philippines. Medalla (1996) explains that overtime, the policies which have been implemented to promote industrialization include those which encourage external trade, foreign and domestic investment, and regional growth.

While industrialization remains an accepted notion of development at present, it is also recogrnized that it brings with it serious environmental problems which macroeconomic policies alone have failed to address. Foremost among these is industrial pollution. Thus, as a response, a national policy of pollution control to complement industrialization has been pursued. The objective is to bring about a more sustainable type of development that is in harmony with the environment.

The general objective of this paper is to investigate the impacts of industrial policies on the manufacturing sector and the interactions between the environmental policy of industrial pollution control and the sector using Metro Cebu as case study. The paper is intended to gather and analyze information useful for identifying problems and developing recommendations relevant to industrial pollution control in urban areas.

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The study uses both primary and secondary data. Institutional data sources include the national and regional offices of relevant government institutions and the project offices of the Industrial Environmental Management Project (IEMP) and Philippine German Project-Industrial Pollution Control Cebu (PGP-IPCC). Published data and information were also obtained from various literature, the most notable of which is the Cebu Integrated Area Development Master Plan (CIADMP) which provides an integrated development plan for the area (PCINKCL 1994a, 1994b, 1994c, 1994d, 1994e). To augment the information gathered, primary data from key government and industry informants were collected through personal interviews.

The paper is subsequently organized as follows: The next three sections provide profiles on the geographic and socioeconomic conditions, the manufacturing sector, and the pollution situation in Metro Cebu. These are followed by two sections assessing the impacts of industrial policies and the industrial pollution control policy on the manufacturing sector. The last section provides the conclusions and recommendations.

GEOGRAPHIC AND SOCIOECONOMIC PROFILE OF METRO CEBU

For the study, Metro Cebu is defined as the region which covers the cities of Cebu, Mandaue and Lapu-lapu and the municipalities of Talisay and Consolacion.[1] The whole area is located in the central part of the island province. Lapu-Lapu City is situated on Mactan Island while the rest of the cities and towns are located on the mainland. The Mactan bridge connects Mactan Island to the mainland.

The population of Metro Cebu has been growing fast over the years due to rapid growth in the resident population and in-migration. It was approximately four-fifths of a million in 1980 (Table 1). Then it rose to about a million in 1990. By 2000, the population will be about one and a third of a million and by 2030, it will reach two million. The three

1. Unlike Metro Manila, Metro Cebu is not an administrative regional subdivision but a development area centered around Cebu City. The CIADMP defined "Metro Cebu" as encompassing the cities of Cebu, Mandaue and Lapu-lapu and the towns of Talisay, Minglanilla, Naga, Compostela, Liloan, Cordova and Consolacion. In this study, the coverage is reduced because manufacturing sector growth in the past 20 years centers only in the cities. The two towns included border the cities and, thus, are directly affected by the environmental impacts of the manufacturing sector. This more restricted definition is also of main interest to the commercial and industrial sectors in Metro Cebu at present (e.g., CRC 1995, p.8).

TABLE 1. Population Estimates for Cities and Municipalities of Metro Cebu, 1980–2030

Cities / Municipalities	1980	1990	2000	2010	2020	2030
Cebu City						
Urban	492,056	627,124	761,826	874,673	971,651	1,056,086
Rural	–	–	–	–	–	–
Total	492,056	627,124	761,826	874,673	971,651	1,056,086
Mandaue City						
Urban	110,990	176,065	257,451	344,032	430,029	508,351
Rural	–	–	–	–	–	–
Total	110,990	176,065	257,451	344,032	430,029	508,351
Lapu-Lapu City						
Urban	99,080	126,104	153,013	175,511	194,827	211,646
Rural	–	–	–	–	–	–
Total	99,080	126,104	153,013	175,511	194,827	211,646
Talisay						
Urban	22,073	34,159	52,961	75,342	100,159	127,963
Rural	47,899	57,600	61,229	58,373	50,672	37,769
Total	69,972	91,759	114,190	133,715	150,831	165,732
Consolacion						
Urban	6,428	9,947	15,422	21,939	29,166	37,262
Rural	21,125	25,907	28,906	29,691	28,832	26,278
Total	27,553	35,854	44,328	51,630	57,998	63,540
Metro Cebu						
Urban	799,651	973,399	1,240,673	1,491,497	1,725,832	1,941,308
Rural	69,024	83,507	90,135	88,064	79,504	64,047
Total	799,651	1,056,906	1,330,808	1,579,561	1,805,336	2,005,355

Source: NEDA (n.d.)

cities of Metro Cebu are classified mainly as urban areas. The two towns are currently rural although some portions are urban.

The main dialect in Metro Cebu is Cebuano, but a significant segment of the population can speak English, Tagalog and Chinese (e.g., CIPC n.d.). The people are predominantly Roman Catholic and highly literate. Metro Cebu is the main educational center of the Visayas and Northern Mindanao regions. It also has the largest domestic and international seaport and airport outside of Metro Manila.

There is little data on the economic status of Metro Cebu as defined in this study. However, the economic success of Cebu province and Metro Cebu is widely narrated in literature (e.g., Villamor 1996; CRC 1995).

In regional terms, economic performance in the past 20 years has been encouraging for the Central Visayas Region (CVR) where Metro Cebu is located (Table 2). The Gross Domestic Product (GDP) and the

output of the manufacturing sector rose in the second half of the 1970s but declined in the first half of the 1980s. In later years until 1995, however, the GDP and the outputs of manufacturing registered healthy growth rates. Furthermore, manufacturing has been the second most important subsector, contributing at least 20 percent to total output. It is also the most significant industrial sector.

PROFILE OF THE MANUFACTURING SECTOR

Manufacturing establishments[2] in Metro Cebu can be classified into two groups: those located outside the Mactan Export Processing Zone (MEPZ) and those located within. There are no available data on all manufacturing firms in Metro Cebu, and so this study profiles only the Board of Investments (BOI)-registered projects, representing the first group of establishments, and the MEPZ firms, representing the second group.[3] Both the BOI projects and MEPZ firms are the direct beneficiaries of the industrial promotion policies of the government.

Manufacturing establishments registered with the BOI

From 1975 to 1996, a total of 318 manufacturing projects in Metro Cebu[4] have been registered with the BOI (Table 3). These projects fall under numerous industry groups, the biggest of which are furniture and

2. This study follows the Philippine Standard Industrial Classification (PSIC) definition of "Manufacturing" (NEDA 1978, p.32). Manufacturing is defined as the mechanical or chemical transformation of inorganic or organic substances into new products, whether work is performed by power-driven machines or by hand, whether done in a factory or in the home, and whether the products are sold at wholesale or retail.

The secondary data available from the sources originally do not classify firms and projects by PSIC group but only provided information on their products. The author classified the firms and projects by PSIC group based on products and with assistance from the BOI, MEPZ and DENR staff. The PSIC was used to group the firms and projects to make the study consistent with previous environment-related industry studies which also use the classification.

3. There are no data available on the establishments not registered with the BOI or not located in MEPZ. Actually, however, data on this type of firms may be tediously generated individually from local municipal records and other sources. Since this is a consuming activity that may take weeks or even months, this was not done in this study.

4. The BOI data classify establishments in terms of "projects" instead of "firms." A project may be viewed as a single production-based activity (e.g., furniture production project, fruit juice production project, etc.) or type of investment of a single firm (e.g., new project, expansion project, etc.). A firm can have many projects, each of which are separately counted in this study.

TABLE 2. Gross Regional Domestic Product of the Central Visayas Region, at Constant Prices, 1975–1995 (In P thousand)

	1975		1980		1985		1990		1995	
	Value	%	Value	%	Value	%	Value	%	Value	%
1. Agri., Fishery, Forestry	4,261,165		5,629,609		5,676,378		6,914,538		7,600,818	
a. Agriculture	4,184,543	14.99	5,567,850	14.84	5,639,488	15.77	6,914,491	14.65	7,600,809	14.43
b. Forestry	76,622	0.27	61,759	0.16	36,890	0.10	47	0.00	9	0.00
2. Industry Sector	10,095,716		14,162,945		11,842,405		15,409,411		15,968,321	
a. Mining and Quarrying	1,423,136	5.10	2,266,533	6.04	2,058,270	5.76	2,161,741	4.58	1,019,179	1.93
b. Manufacturing	6,908,679	24.75	8,302,703	22.14	7,709,207	21.56	9,905,726	20.99	10,693,549	20.30
c. Construction	1,411,120	5.05	3,103,358	8.27	1,224,139	3.42	2,416,561	5.12	2,690,002	5.11
d. Electricity, Gas, Water	352,781	1.26	490,351	1.31	850,789	2.38	925,383	1.96	1,565,591	2.97
3. Service Sector	13,562,099		17,715,517		18,235,292		24,869,320		29,110,518	
a. Transport., Comm., Storage	1,672,169	5.99	2,204,203	5.88	2,021,387	5.65	2,697,753	5.72	3,123,636	5.93
b. Trade	6,842,012	24.51	9,069,179	24.18	9,475,882	26.50	13,374,544	28.34	15,806,029	30.00
c. Finance	568,557	2.04	893,968	2.38	543,480	1.52	942,574	2.00	1,079,916	2.05
d. O. Dwellings and Real Estate	2,190,766	7.85	2,429,297	6.48	2,483,431	6.95	3,177,188	6.73	3,533,127	6.71
e. Private Services	1,473,000	5.28	2,064,513	5.50	2,612,701	7.31	3,361,744	7.12	3,780,361	7.18
f. Government Services	815,595	2.92	1,054,357	2.81	1,098,411	3.07	1,315,517	2.79	1,787,449	3.39
GROSS DOMESTIC PRODUCT	27,918,980	100.00	37,508,071	100.00	35,754,075	100.00	47,193,269	100.00	52,679,657	100.00
Periodic Growth Rate of Mfg.	–		20.18		-7.15		28.49		7.95	
Periodic Growth Rate of GDP	–		34.35		-4.68		32.00		11.63	

Source: NSCB.

TABLE 3. BOI-Registered Manufacturing Projects in Metro Cebu, by Industry Group, 1975–1996

PSIC Code	Industry Group	Number of Projects	Percent to Total
311 & 312	Food	54	16.98
313	Beverages	–	–
314	Tobacco	–	–
321	Textile	9	2.83
322	Wearing apparel except footwear	11	3.46
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	0.31
324	Footwear, except rubber, plastic or wood furniture	2	0.63
331	Wood, wood and cork products, except furniture	13	4.09
332	Furniture and fixtures, except primarily of metal (including repairs)	85	26.73
341	Paper and paper products	4	1.26
342	Printing, publishing and allied industries	–	–
351	Industrial chemicals	3	0.94
352	Other chemical products	9	2.83
353	Petroleum refineries	–	–
354	Miscellaneous products of petroleum and coal	–	–
355	Rubber products	1	0.31
356	Plastic products, n.e.c.	6	1.89
361	Pottery, china and earthenware	2	0.63
362	Glass and glass products	–	–
363	Cement	–	–
369	Other non-metallic mineral products	20	6.29
371	Iron and steel basic industries	4	1.26
372	Non-ferrous metal basic industries	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	7	2.20
382	Machinery except electrical	3	0.94
383	Electrical machinery, apparatus, appliances and supplies	3	0.94
384	Transport equipment	3	0.94
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	1	0.31
386	Furniture and fixtures primarily of metal (including repairs)	8	2.52
390	Other industries	10	3.14
400	Mixed industries	59	18.55
	TOTAL	**318**	**100.00**

Source of basic data: BOI, Makati office data files.

fixtures and food. There is also a large number of projects falling under more than one industry group.[5]

Over the same period, the number of BOI projects has grown phenomenally (Table 4). Growth was faster in the 1980s than in the 1990s but overall growth between sub-periods was very high on average. The share of furniture and fixtures peaked in the early 1980s and subsequently declined. On the other hand, the share of food manufacturing was stable in the late 1970s and early 1980s, declined in the late 1980s, and recovered in the early 1990s.

As of 1996, 73 percent of the BOI-registered projects are operating (Table 5). About 10 percent are still in pre-operating stage while others have either ceased operating, not operated at all, or no relevant data available. Furniture and fixtures and food manufacturing are the biggest industry groups among the operating firms. The other big industries are the manufacturing of other non-metallic mineral products, wood and wood products, wearing apparel and other industries.

In terms of location, most of the projects are in the three cities, notably Mandaue, while only a few are in the towns (Table 6). It is interesting to note that most of the firms belonging to the largest industry groups, furniture and fixtures and food manufacturing, are located in Mandaue City.

Manufacturing establishments located in the MEPZ

The present MEPZ is composed of two sites, MEPZ I and MEPZ II, both in Lapu-Lapu City. The former has a total land area of 119.4 hectares while the latter has 62 hectares. There are 91 operating firms in MEPZ I as of this writing, of which 88 are manufacturing.[6] On the other hand, there are only two firms in MEPZ II, both manufacturing.

Classifications of the manufacturing firms located in both MEPZ I and MEPZ II are summarized in Table 7. The largest industry groups are the manufacturing of wearing apparel, electrical machinery, and professional and scientific equipment. The other industry groups are

5. The PSIC classification does not have an industry group that takes account of projects whose products can be classified under more than one industry. To solve this problem, a new group named "Mixed Industries" and given the "PSIC Code" of 400 was invented to take account of such projects.

6. In contrast to BOI data, MEPZ data classifies establishments as "firms" instead of "projects." This study follows the standard definition of a "firm." It means a single business enterprise, be it a sole proprietorship, partnership or corporation. It can have more than one project.

TABLE 4. BOI-Registered Manufacturing Projects in Metro Cebu, by Industry Group and Period of Registration, 1975–1996

PSIC Code	Industry Group	Period of Registration (Number of Projects)									
		1975–1980		1981–1985		1986–1990		1991–1996		No Data	
		No.	%	No.	%	No.	%	No.	%	No.	%
311 & 312	Food	6	20.00	10	20.41	15	11.54	23	21.30	–	–
313	Beverages	–	–	–	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–	–	–	–
321	Textile	–	–	1	2.04	5	3.85	3	2.78	–	–
322	Wearing apparel except footwear	2	6.67	2	4.08	2	1.54	5	4.63	–	–
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	–	–	1	0.77	–	–	–	–
324	Footwear, except rubber, plastic or wood footwear	1	3.33	–	–	–	–	1	0.93	–	–
331	Wood, wood and cork products, except furniture	–	–	2	4.08	6	4.62	5	4.63	–	–
332	Furniture and fixtures, except primarily of metal (including repairs)	9	30.00	27	55.10	35	26.92	13	12.04	1	100.00
341	Paper and paper products	–	–	–	–	3	2.31	1	0.93	–	–
342	Printing, publishing and allied industries	–	–	–	–	–	–	–	–	–	–
351	Industrial chemicals	–	–	–	–	3	2.31	–	–	–	–
352	Other chemical products	2	6.67	–	–	2	1.54	5	4.63	–	–
353	Petroleum refineries	–	–	–	–	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–	–	–	–
355	Rubber products	–	–	–	–	–	–	1	0.93	–	–
356	Plastic products, n.e.c.	–	–	–	–	2	1.54	4	3.70	–	–
361	Pottery, china and earthenware	–	–	–	–	1	0.77	1	0.93	–	–

Table 4: Continued

362	Glass and glass products	–	–	–	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–	–	–	–
369	Other non-metallic mineral products	–	–	1	2.04	16	12.31	3	2.78	–	–
371	Iron and steel basic industries	2	6.67	–	–	2	1.54	–	–	–	–
372	Non-ferrous metal basic industries	–	–	–	–	–	–	–	–	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixture primarily of metal	1	3.33	–	–	1	0.77	5	4.63	–	–
382	Machinery except electrical	–	–	–	–	1	0.77	2	1.85	–	–
383	Electrical machinery, apparatus, appliances and supplies	1	3.33	–	–	1	0.77	1	0.93	–	–
384	Transport equipment	1	3.33	–	–	1	0.77	1	0.93	–	–
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	–	–	–	–	–	–	1	0.93	–	–
386	Furniture and fixtures primarily of metal (including repairs)	–	–	–	–	1	0.77	7	6.48	–	–
390	Other industries	1	3.33	1	2.04	2	1.54	6	5.56	–	–
400	Mixed industries	4	13.33	5	10.20	30	23.08	20	18.52	–	–
	TOTAL	**30**	**100.00**	**49**	**100.00**	**130**	**100.00**	**108**	**100.00**	**1**	**100.00**
	Cumulative total	30		79		209		317		318	
	Periodic growth rate (%)	–		163.00		165.00		51.67			
	Periodic average growth rate							76.00			

Source of basic data: BOI, Makati office data files.

TABLE 5. BOI-Registered Manufacturing Projects in Metro Cebu, by Industry Group and Current Status of Operation, 1975–1996

PSIC Code	Industry Group	Status of Operation					
		Operating	Pre-Operating	Stopped Operating	Cancelled/ Never Operated	No Data	Total
311 & 312	Food	39	6	1	5	3	54
313	Beverages	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–
321	Textile	7	1	–	1	–	9
322	Wearing apparel except footwear	6	2	2	1	–	11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	1	–	–	1
324	Footwear, except rubber, plastic or wood footwear	1	1	–	–	–	2
331	Wood, wood and cork products, except furniture	7	3	1	1	1	13
332	Furniture and fixtures, except primarily of metal (including repairs)	69	2	4	5	5	85
341	Paper and paper products	3	–	1	–	–	4
342	Printing, publishing and allied industries	–	–	–	–	–	–
351	Industrial chemicals	3	–	–	–	–	3
352	Other chemical products	6	3	–	–	–	9
353	Petroleum refineries	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–
355	Rubber products	–	1	–	–	–	1
356	Plastic products, n.e.c.	3	–	–	2	1	6
361	Pottery, china and earthenware	1	1	–	–	–	2

Table 5: Continued

362	Glass and glass products	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–
369	Other non-metallic mineral products	14	2	2	2	–	20
371	Iron and steel basic industries	1	–	2	1	–	4
372	Non-ferrous metal basic industries	–	–	–			
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	5	1	1	–	–	7
382	Machinery except electrical	3	–	–	–	–	3
383	Electrical machinery, apparatus, appliances and supplies	–	1	1	1	–	3
384	Transport equipment	3	–	–	–	–	3
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	1	–	–	–	–	1
386	Furniture and fixtures primarily of metal (including repairs)	6	2	–	–	–	8
390	Other industries	8	–	–	2	–	10
400	Mixed industries	47	6	5	–	1	59
	TOTAL	**233**	**32**	**21**	**21**	**11**	**318**
	% to total	73.27	10.06	6.60	6.60	3.46	100.00

Source of basic data: BOI, Makati office data files.

TABLE 6. BOI-Registered Manufacturing Projects in Metro Cebu, By Industry Group and Plant Location, 1975–1996

PSIC Code	Industry Group	Plant Location						
		Cebu City	Mandaue City	Lapu-Lapu City	Consolacion	Talisay	No Data	Total
311 & 312	Food	6	40	2	2	3	1	54
313	Beverages	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–
321	Textile	2	5	–	–	2	–	9
322	Wearing apparel except footwear	6	5	–	–	–	–	11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	1	–	–	–	1
324	Footwear, except rubber, plastic or wood footwear	2	–	–	–	–	–	2
331	Wood, wood and cork products, except furniture	6	7	–	–	–	–	13
332	Furniture and fixtures, except primarily of metal (including repairs)	16	56	–	–	10	3	85
341	Paper and paper products	2	2	–	–	–	–	4
342	Printing, publishing and allied industries	–	–	–	–	–	–	–
351	Industrial chemicals	2	1	–	–	–	–	3
352	Other chemical products	2	6	–	–	–	1	9
353	Petroleum refineries							
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–
355	Rubber products	–	–	–	1	–	–	1

Table 6: Continued

356	Plastic products, n.e.c.	1	5	–	–	–	–	6
361	Pottery, china and earthenware	–	2	–	–	–	–	2
362	Glass and glass products	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–
369	Other non-metallic mineral products	4	13	3	–	–	–	20
371	Iron and steel basic industries	2	2	–	–	–	–	4
372	Non-ferrous metal basic industries	–	–	–	–	–	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	–	6	1	–	–	–	7
382	Machinery except electrical	1	1	–	–	1	–	3
383	Electrical machinery, apparatus, appliances and supplies	2	1	–	–	–	–	3
384	Transport equipment	–	3	–	–	–	–	3
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	1	–	–	–	–	–	1
386	Furniture and fixtures primarily of metal (including repairs)	1	6	1	–	–	–	8
390	Other industries	5	4	–	–	1	–	10
400	Mixed industries	17	36	5	–	–	1	59
	TOTAL	**78**	**201**	**13**	**3**	**17**	**6**	**318**
	% to total	24.53	63.21	4.09	0.94	5.35	1.89	100.00

Source of basic data: BOI, Makati office data files.

the manufacturing of food products, leather products, wood and wood products, paper and paper products, printing, industrial chemical products, plastic products, iron and steel basic industries, non-ferrous metal basic industries, fabricated metal products, machinery except electrical, transport equipment and others. Like the BOI projects, a good number of the MEPZ firms is classified as falling under more than one industrial category.

Since 1979, the number of MEPZ firms has increased substantially (Table 8). The firms grew very slowly during the first half of the 1980s, but suddenly proliferated starting the second half. There were several reasons put forward regarding the abrupt development of the MEPZ in recent years. These include site specific factors such as improved infrastructure and services support, advantageous land rent and similar incentives, and safety and security in the zone, as well as more general factors such as the cheap and English-speaking labor force and better political climate that prevailed in Metro Cebu after the political upheaval of 1986.

Scale of operations of manufacturing establishments

There are no adequate secondary data which can be used to classify the manufacturing establishments in terms of scale of operations. The CIADMP, however, had some classifications of industry groups in terms of scale (PCINKCL 1994c, p.2-5). Both furniture and fixtures and food manufacturing, which are the biggest BOI industry groups, belong to the Small and Medium Enterprises (SME) classification.

In the MEPZ, both SMEs and large-scale firms exist. The largest industry group in the MEPZ, manufacturing of wearing apparel, was classified as SME by the CIADMP. Thus, even from these limited information, it can be concluded that a significant number of both BOI-registered projects and MEPZ firms are SMEs.

POLLUTION PROFILE

Pollution levels

Metro Cebu is facing many of the environmental pollution problems bugging similarly situated urban areas. The main problems are ground, surface and marine water pollution and air pollution.

TABLE 7. Manufacturing Firms in the MEPZ, by Industry Group, 1996

PSIC Code	Industry Group	Number of Firms	Percent to Total
311 & 312	Food	2	2.22
313	Beverages	–	–
314	Tobacco	–	–
321	Textile	–	–
322	Wearing apparel except footwear	19	21.11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	3	3.33
324	Footwear, except rubber, plastic or wood footwear	–	–
331	Wood, wood and cork products, except furniture	1	1.11
332	Furniture and fixtures, except primarily of metal (including repairs)	–	–
341	Paper and paper products	1	1.11
342	Printing, publishing and allied industries	1	1.11
351	Industrial chemicals	2	2.22
352	Other chemical products	–	–
353	Petroleum refineries	–	–
354	Miscellaneous products of petroleum and coal	–	–
355	Rubber products	–	–
356	Plastic products, n.e.c.	3	3.33
361	Pottery, china and earthenware	–	–
362	Glass and glass products	–	–
363	Cement	–	–
369	Other non-metallic mineral products	–	–
371	Iron and steel basic industries	4	4.44
372	Non-ferrous metal basic industries	2	2.22
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	4	4.44
382	Machinery except electrical	7	7.78
383	Electrical machinery, apparatus, appliances and supplies	10	11.11
384	Transport equipment	3	3.33
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	9	10.00
386	Furniture and fixtures primarily of metal (including repairs)	–	–
390	Other industries	6	6.67
400	Mixed industries	13	14.44
	TOTAL	**90**	**100.00**

Source of basic data: MEPZ office data files.

TABLE 8. Manufacturing Firms in the MEPZ, by Industry Group and Period of Registration, 1975–1996

PSIC Code	Industry Group	Period of Registration							
		1979-1980		1981-1985		1986-1990		1991-1996	
		No.	%	No.	%	No.	%	No.	%
311 & 312	Food	–	–	1	50.00	–	–	1	1.72
313	Beverages	–	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–	–
321	Textile	–	–	–	–	–	–	–	–
322	Wearing apparel except footwear	1	25.00	–	–	5	19.23	13	22.41
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	25.00	–	–	–	–	2	3.45
324	Footwear, except rubber, plastic or wood footwear	–	–	–	–	–	–	–	–
331	Wood, wood and cork products, except furniture	–	–	1	50.00	–	–	–	–
332	Furniture and fixtures, except primarily of metal (including repairs)	–	–	–	–	–	–	–	–
341	Paper and paper products	–	–	–	–	–	–	1	1.72
342	Printing, publishing and allied industries	–	–	–	–	–	–	1	1.72
351	Industrial chemicals	–	–	–	–	1	3.85	1	1.72
352	Other chemical products	–	–	–	–	–	–	–	–
353	Petroleum refineries	–	–	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–	–
355	Rubber products	–	–	–	–	–	–	–	
356	Plastic products, n.e.c.	–	–	–	–	–	–	3	5.17
361	Pottery, china and earthenware	–	–	–	–	–	–	–	–

Table 8: Continued

362	Glass and glass products	–	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–	–
369	Other non-metallic mineral products	–	–	–	–	–	–	–	–
371	Iron and steel basic industries	–	–	–	–	1	3.85	3	5.17
372	Non-ferrous metal basic industries	–	–	–	–	–	–	2	3.45
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	–	–	–	–	2	7.69	2	3.45
382	Machinery except electrical	–	–	–	–	2	7.69	5	8.62
383	Electrical machinery, apparatus, appliances and supplies	1	25.00	–	–	4	15.38	2	3.45
384	Transport equipment	–	–	–	–	1	3.85	7	12.07
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	1	25.00	–	–	1	3.85	–	–
386	Furniture and fixtures primarily of metal (including repairs)	–	–	–	–	–	–	–	–
390	Other industries	–	–	–	–	4	15.38	2	3.45
400	Mixed industries	–	–	–	–	5	19.23	8	13.79
	TOTAL	**4**	**100.00**	**2**	**100.00**	**26**	**100.00**	**58**	**100.00**
	Cumulative total	4		6		32		90	
	Periodic growth rate (%)	–		50.00		433.33		181.25	
	Periodic average growth rate							166.15	

Source of basic data: MEPZ office data files.

Although there are no time-series data that can point to the worsening environmental pollution in Metro Cebu, cross-section data provide some indication of the seriousness of the problem. For ground water pollution, the situation is reflected in Table 9. In several places, the ground water has high salinity and chloride content levels, or has chemical quality which is characterized by dominant ions of alkaline earth and weak acids (PCINKCL 1994c, p.7-5). The high salinity levels, in particular, already exceed established standards for drinking water.

TABLE 9. Ground Water Quality in Metro Cebu (Mg/L)

Cation	Permissible Level	Talisay	Pardo	Lahug-Guadalupe	Talamban	Consolacion	Mactan
Ca2+	75	104–160	52–125	87–104	80–116	88–121	88–174
Mg2+	50	22-34	4-46	15-30	7-280	2-14	–
Na+	–	–	–	–	–	–	–
NH4+	–	–	–	–	–	–	–
Anions							
NO3-	30	4-7	7-30	7-36	7-13	4-13	9-1
C1-	200	4–17	17–61	14–55	15–36	14–130	43–757
SO42-	200	50-55	<0.02-30	7-29	17-34	<0.02-28	10-37
Parameter							
TDS	–	492-526	350-646	414-584	384-508	326-700	354-1800
TSS	–	4-56	2-32	4-34	2-38	2–18	6-104

Source: Metro Cebu Water District (MCWD) as cited in PCINKCL (1994c).

The problem of surface water pollution is no less serious. Water samples of major rivers in Metro Cebu contain heavy metals like lead, copper, cadmium, chromium, nickel, zinc and mercury, and the toxic substance arsenic. In many cases, the concentration of heavy metals in rivers exceeds acceptable standards.

There are indications that the marine waters of Metro Cebu are as compromised as its ground and surface waters. Data from numerous sampling stations put up in the beaches of Talisay (Table 10) indicate that in many instances, the coliform bacteria in said waters far exceed permissible standards.

It cannot be ascertained just how much of the ground, surface and marine water pollution is caused by industrial activity. It is clear, however, that industries add to the problem as some firms use ground water extracted from deep well in their operations and dump wastes into the river systems and coastal waters (Ibid., pp. 10-21, 7-4).

TABLE 10. Coliform Bacteria in Talisay Beaches, 1992

Station	Pook	Sawsawan	Cogon	Duljo	Ludo
Sampling date					
4/21	490	49	46	13,000	24,000
5/19	33	46	47	13,000	24,000
6/17	–	23	23	490	350
7/14	2,400	49	8	350	540
8/31	–	240,000	130,000	–	5
9/29	130	54,000	790	4,900	240,000
10/20	–	27	–	–	920
11/25	49	1	1,600	540	2,400

Source: PCINKCL (1994c).
Note: Standard is 1,000 MPN/100ml.

In the case of air pollution, some data for air quality in Metro Cebu, measured in terms of Total Suspended Particulates (TSP), are available (Table 11). In several sampling stations in the area, air quality levels fail to meet acceptable standards. Again, it is not known how much of the pollution is caused by motor vehicles or industrial activity, but it has been cited that the latter is an important pollution source, specifically power plants and manufacturing firms (Ibid.,p. 7-6).

Pollution potential of manufacturing establishments

To ascertain what industry groups may have contributed substantially to pollution, the BOI projects and MEPZ firms are matched with the pollution potential classification of industries formulated by the Environmental Management Bureau (1993). The results are presented in Tables 12 and 13.

Of the BOI projects, 28 percent is classified potentially highly pollutive, 10 percent pollutive, and 38 percent non-pollutive. On the other hand, 4 percent is extremely hazardous, 48 percent hazardous, and 25 percent non-hazardous. Of the two biggest industry groups, furniture manufacturing is considered non-pollutive but hazardous, while food manufacturing is considered as highly pollutive but non-hazardous.

Among the MEPZ firms, 15 percent is classified highly pollutive, 25 percent pollutive, and 38 percent non-pollutive. Two percent is extremely hazardous, 39 percent hazardous, and 38 percent non-hazardous. Of the three biggest industry groups, wearing apparel

TABLE 11. Air Quality TSP (PM-10) Monitoring Values and Evaluation in Metro Cebu, 1992

Sampling Station and Location	7/1/92	8/6/92	9/18/92	10/6/92	11/1/92	12/18/92
DENR Region 7 Office Banilad, Mandaue	117.14 (P)	113.94 (P)	55.30 (P)	70.70 (P)	105.80 (P)	70.10 (P)
San Miguel Corp. Highway, Mandaue	594.85 (F)	149.36 (P)	248.20 (F)	252.70 (F)	367.00 (F)	220.20 (F)
Marine Colloids Phils. Looc, Mandaue	193.23 (F)	33.6 (P)	136.0 (P)	92.94 (P)	146.50 (P)	117.20 (P)
Ludo & Luym Corp. Tupas St., Cebu	53.88 (P)	91.88 (P)	146.75 (P)	81.86 (P)	179.60 (F)	135.20 (P)
O. Cabando's Res. Sudlon, Lahug, Cebu	110.87 (P)	59.46 (P)	226.25 (F)	67.50 (P)	–	764.64 (F)
Engr. Abangan's Res. Pardo, Cebu	96.97 (P)	20.84 (P)	64.12 (P)	149.00 (P)	169.96 (F)	No Sampling

Source: PCINKCL (1994c).
Note:
TSP: Total Suspended Particulates
(PM-10) = High volume with 10 micron particle-size inlet; Gravemetric.
TSP: Standard Value (Short term) = 15– ug/cu cm
Evaluation: (P) denotes "Passed"; (F) "Failed"

manufacturing is considered non-pollutive and non-hazardous, electrical machinery manufacturing is pollutive and hazardous, and professional equipment manufacturing is non-pollutive and non-hazardous.

Thus, a substantial number of BOI projects and MEPZ firms are potentially pollutive and/or hazardous, including those belonging to the largest industry groups which have a large SME composition. Comparatively, BOI projects and MEPZ firms have relatively similar pollution potentials.

Summing up to this point, some important observations can already be made. *First*, the profile of Metro Cebu shows that the area is highly populated and will continue to be so. Because of this, congestion will be a worsening problem. *Second*, the profile of the manufacturing sector shows that there has been rapid growth in the sector in recent years but growth is concentrated in the cities. The largest industry groups in the manufacturing sector are substantially comprised of SMEs. *Third*, the pollution profile indicates that Metro Cebu is facing serious environmental problems including air and water pollution which are partly caused by industrial activity. This positive relationship between pollution and industrial growth is further suggested by the

fact that many of the manufacturing groups are potentially pollutive and/or hazardous, including those which are substantially composed of SMEs.

The above observations have some environmental implications. The congestion of people coupled by the concentration of industrial firms in urban areas highlight the great risk that industrial pollution poses to human health. Furthermore, prevalence of potentially pollutive and/or hazardous SMEs brings out a major industrial pollution issue: how to conduct pollution management among firms whose investment potential for pollution prevention may fall way short of requirements.

ASSESSMENT OF THE IMPACTS OF INDUSTRIAL POLICIES ON THE MANUFACTURING SECTOR

Impacts of foreign trade policies

An analysis of the long history of foreign trade policies of the Philippines highlights five distinct periods of major policy changes (Medalla 1996). The first was prior to 1980 when trade policies were generally restrictive and protectionist. This was succeeded by the 1981–1985 period when initial easing of the trade restrictions occurred. The third and fourth periods, 1986–1990 and 1991–1995, saw more relaxation of trade restrictions. Finally, in the current period, 1996-2000, the restrictions were reduced even further.

The easing of trade restrictions is expected to generate positive developments to the economy. In particular, it should result in the growth of an export-oriented and highly competitive industrial sector that is less concentrated in large-scale and capital-intensive firms but deconcentrated to include more and more SMEs.

The data earlier shown indicate that the gradual easing of trade restrictions over the years may have boosted industrial growth in Metro Cebu. Prior to the start of liberalization in 1980 for instance, the BOI-registered projects were few (Table 4). After 1980, the number of firms grew at periodic rates which were impressive. As earlier shown, the number of MEPZ firms (Table 8) have similarly increased.

In addition, the relaxing of trade restrictions may have resulted in the growth of an export-oriented and highly competitive industrial sector. Over the entire 1975–1996 period, an overwhelming majority (92 percent) of the BOI-registered projects have been export producers,

TABLE 12. BOI-Registered and Operating Manufacturing Projects in Metro Cebu, by Industry Group and Pollution Potential, 1996

PSIC Code	Major Industry Group	Pollution Potential	No. of Firms	Percent to Total
311 & 312	Food	Highly Pollutive/Non-Hazardous Pollutive/Non-Hazardous	39	16.74
313	Beverages	–	–	–
314	Tobacco	–	–	–
321	Textile	Pollutive/Hazardous	7	3.00
322	Wearing apparel except footwear	Non-Pollutive/Non-Hazardous	6	2.58
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	–
324	Footwear, except rubber, plastic or wood footwear	Non-Pollutive/Non-Hazardous	1	0.43
331	Wood, wood and cork products, except furniture	Non-Pollutive/Hazardous	7	3.00
332	Furniture and fixtures, except primarily of metal (including repairs)	Non-Pollutive/Hazardous	69	29.61
341	Paper and paper products	Highly Pollutive/Hazardous	3	1.29
342	Printing, publishing and allied industries	–	–	–
351	Industrial chemicals	Highly Pollutive/Extremely Hazardous	3	1.29
352	Other chemical products	Highly Pollutive/Extremely Hazardous	6	2.58
353	Petroleum refineries	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–
355	Rubber products	–	–	–
356	Plastic products, n.e.c.	Pollutive/Hazardous	3	1.29

Table 12: Continued

361	Pottery, china and earthenware	Pollutive/Hazardous	1	0.43
362	Glass and glass products	–	–	–
363	Cement	–	–	–
369	Other non-metallic mineral products	Highly Pollutive/Hazardous	14	6.01
371	Iron and steel basic industries	Highly Pollutive/Hazardous	1	0.43
372	Non-ferrous metal basic industries	–	–	
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	Non-Pollutive/Non-Hazardous	5	2.15
382	Machinery except electrical	Pollutive/Hazardous	3	1.29
383	Electrical machinery, apparatus, appliances and supplies	Pollutive/Hazardous	–	–
384	Transport equipment	Pollutive/Hazardous	3	1.29
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	Non-Pollutive/Non-Hazardous	1	0.43
386	Furniture and fixtures primarily of metal (including repairs)	Pollutive/Non-Hazardous	6	2.58
390	Other industries	Mixed	8	3.43
400	Mixed industries	Mixed	47	20.17
	TOTAL		**233**	**100.00**

Source of basic data: BOI, Makati office data files.
EMB (1993).

TABLE 13. Manufacturing Firms in the MEPZ, By Industry Group and Pollution Potential, 1996

PSIC Code	Major Industry Group	Pollution Potential	No. of Firms	Percent to Total
311 & 312	Food	Highly Pollutive/Non-Hazardous Pollutive/Non-Hazardous	2	2.22
313	Beverages	–	–	–
314	Tobacco	–	–	–
321	Textile	–	–	–
322	Wearing apparel except footwear	Non-Pollutive/Non-Hazardous	19	21.11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	Highly Pollutive/Hazardous	3	3.33
324	Footwear, except rubber, plastic or wood footwear	–	–	–
331	Wood, wood and cork products, except furniture	Non-Pollutive/Hazardous	1	1.11
332	Furniture and fixtures, except primarily of metal (including repairs)	–	–	–
341	Paper and paper products	Highly Pollutive/Hazardous	1	1.11
342	Printing, publishing and allied industries	Non-Pollutive/Hazardous	1	1.11
351	Industrial chemicals	Highly Pollutive/Extremely Hazardous	2	2.22
352	Other chemical products	–	–	–
353	Petroleum refineries	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–
355	Rubber products	–		–
356	Plastic products, n.e.c.	Pollutive/Hazardous	3	3.33

Table 13: Continued

361	Pottery, china and earthenware	–	–	–
362	Glass and glass products	–	–	–
363	Cement	–	–	–
369	Other non-metallic mineral products	–	–	–
371	Iron and steel basic industries	Highly Pollutive/Hazardous	4	4.44
372	Non-ferrous metal basic industries	Highly Pollutive/Hazardous	2	2.22
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	Non-Pollutive/Non-Hazardous	4	4.44
382	Machinery except electrical	Pollutive/Hazardous	7	7.78
383	Electrical machinery, apparatus, appliances and supplies	Pollutive/Hazardous	10	11.11
384	Transport equipment	Pollutive/Hazardous	3	3.33
385	Professional and scientifc and measuring and controlling equipment, n.e.c. and photographic and optical instrument	Non-Pollutive/Non-Hazardous	9	10.00
386	Furniture and fixtures primarily of metal (including repairs)	–	–	–
390	Other industries	Mixed	6	6.67
400	Mixed industries	Mixed	13	14.44
	TOTAL		**90**	**100.00**

Sources of basic data: MEPZ office data files.
EMB (1993).

while only a few, about 6 percent, have catered to the domestic market (Table 14). By their nature, the manufacturing firms in MEPZ have been export-oriented as well.

In terms of industrial deconcentration, as already mentioned, the manufacturing sector includes SMEs that comprise the largest industry groups within the sector. In particular, BOI-registered furniture and food manufacturing projects and MEPZ-located wearing apparel manufacturing firms are classified as SMEs.

The export-oriented nature of the manufacturing sector of Metro Cebu potentially has implications on the environment. *First*, as several of the exporting industry groups which are potentially pollutive and/or hazardous expand as a result of export promotion policy, the likelihood of worsening industrial pollution also rises. Thus, more pollution may be a negative unintended result of industrial policy. *Second*, the expansion of export-oriented but potentially pollutive and/or hazardous industry groups brings out as an issue the implications of numerous environment-related trade international agreements and regulations on these industries. For instance, how will environment-related standards set by some importing countries affect future exports? Will food manufacturing firms, many of which are SMEs, be able to meet product standards, e.g., reduced lead content of canned exports, and process standards, e.g., non-use of chemicals in certain production processes, and remain competitive? These are some of the important concerns which the manufacturing sector will be facing in the near future.

Impacts of invesment policies

Similar to foreign trade policies, investment policies for stimulating industrial growth have been implemented for a long time. However, the institutionalization of the granting of investment incentives commenced only in 1967. In summary, there are five major legislations implementing the granting of investment incentives. These are R.A. 5186 or the Investment Incentives Act of 1967, R.A. 6135 or The Export Incentives Act of 1970, P.D. 1789 or The Omnibus Investments Code of 1981, B.P. 391 or The Investment Incentive Policy Act of 1983, and E.O. 226 or The Omnibus Investments Code of 1987. These laws provided various incentives to industry, including the manufacturing sector.

Aside from encouraging investment per se, an aggressive policy initiative to particularly attract and promote foreign investment in the

TABLE 14. BOI-Registered Manufacturing Projects in Metro Cebu, by Industry Group and Type of Producers, 1975-1996

PSIC Code	Industry Group	Type of Producer			
		Export Producer	Domestic Producer	No Data	Total
311 & 312	Food	46	7	1	54
313	Beverages	–	–	–	–
314	Tobacco	–	–	–	–
321	Textile	8	1	–	9
322	Wearing apparel except footwear	11	–	–	11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	–	–	1
324	Footwear, except rubber, plastic or wood footwear	2	–	–	2
331	Wood, wood and cork products, except furniture	13	–	–	13
332	Furniture and fixtures, except primarily of metal (including repairs)	83	1	1	85
341	Paper and paper products	4	–	–	4
342	Printing, publishing and allied industries	–	–	–	–
351	Industrial chemicals	2	1	–	3
352	Other chemical products	8	1	–	9
353	Petroleum refineries	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–
355	Rubber products	1	–	–	1
356	Plastic products, n.e.c.	6	–	–	6
361	Pottery, china and earthenware	2	–	–	2
362	Glass and glass products	–	–	–	–
363	Cement	–	–	–	–
369	Other non-metallic mineral products	20	–	–	20
371	Iron and steel basic industries	2	2	–	4
372	Non-ferrous metal basic industries	–	–	–	–
381	Fabricated metal products, except machinery and equip't, furniture and fixtures primarily of metal	3	4	–	7
382	Machinery except electrical	1	2	–	3
383	Electrical machinery, apparatus, appliances and supplies	3	–	–	3
384	Transport equipment	2	1	–	3
385	Professional and scientific and measuring and controlling equip't, n.e.c. and photographic and optical instrument	1	–	–	1
386	Furniture and fixtures primarily of metal (including repairs)	8	–	–	8
390	Other industries	10	–	–	10
400	Mixed industries	57	–	2	59
	TOTAL	**294**	**20**	**4**	**318**
	%to total	92.45	6.29	1.26	100.00

Sourceof basic data: BOI, Makati office data files.

country has been ongoing. This policy was operationalized via implementation of the Foreign Investment Act of 1992. Before this, foreign investors were afforded investment incentives under the earlier mentioned legislations.

The specific incentives provided by the legislations as well as their expected impacts were summarized in Medalla (1996). In general, the desired impact of investment incentives is the increase in the number and level of investment by beneficiary firms, both local and foreign.

Over time and across legislations granting the incentives, there has been an increase in the number of beneficiary firms in the manufacturing sector of Metro Cebu. For instance, the BOI-registered projects have been increasing in relation to the chronologically ordered incentive legislations (Table 15). The rise is noticeably more since the late 1980s until the present, during the implementation of E.O. 226.

There is no data on the actual levels of investment generated under the specific legislations. However, the Department of Trade and Industry (1996) reported that in 1994, BOI-approved investment in Cebu province totalled P20.03 billion and has been rising rapidly.

In terms of ownership, a substantial portion of the BOI-registered firms in Metro Cebu, about 40 percent, is fully owned by the locals (Table 16). Only a small portion is fully owned by foreigners. About 21 percent of the firms are joint ventures between locals and foreigners. In the MEPZ, the data on foreign investment are even more encouraging. Of the manufacturing firms, 17 percent, are owned by Filipinos while the great majority are foreign owned, mostly by Japanese (Table 17). This means that, to a large extent, the policy of promoting foreign investments is working.

Again, some interesting environment-related issues are identified from the foregoing discussion. *First*, the type of ownership of firms can influence prospects for industrial pollution management. For instance, foreign firms may have better access to new technology and financial resources for combatting pollution. Along this line, pollution control among these firms, such as those in the MEPZ, may have a better chance of being funded and implemented. *Second*, the existence of several locally owned manufacturing projects outside the MEPZ implies contradicting possibilities related to environmental protection. On the one hand, as Table 16 shows, many of the BOI-registered furniture and fixture and food manufacturing projects which are SMEs are also owned by locals. Among these projects, pollution control may be harder to implement as generating adequate funds for

environmental protection can be difficult. On the other hand, local owners whose personal welfare and properties may be directly affected by pollution may be more sensitive and committed to addressing the problem.

Impacts of regional growth policy

The policy of regional dispersion of industries has been aggressively implemented by the government since the 1970s. Toward this end, export processing zones have been put up and special incentives granted to firms locating outside of the national capital region. Then, R.A. 7916 or the Special Economic Zone Act of 1995 was legislated which created the PEZA to administer the different special economic zones in the Philippines.

Currently, there are already four government-owned economic zones, of which the MEPZ I is one, and eight privately-owned economic zones. In addition, there are four newly approved economic zones, MEPZ II among them. The expected impact of the economic zones is the rise in the number and level of investment of firms located within it.

To a large degree, the policy of regional dispersion through the development of economic zones have been successful in generating investment for Metro Cebu. As earlier shown, in 1979–1980 there were only four manufacturing firms located in the MEPZ (Table 7). The number of firms remained low in the early 1980s, but saw a very significant rise in the late 1980s and early 1990s.

Today, the MEPZ is arguably the most successful economic zone in the country. Compared to other export processing zones, it accomplishes more of its export, employment and trade balance targets (Table 18). These achievements reflect well the regional dispersion policy of the national government.

The policy of regional growth promotion has implications on environment protection in Metro Cebu as well. The concentration of industrial development in the MEPZ will favor proper pollution control as wastes can be handled better. Furthermore, since MEPZ is run by the government, inter-firm and public-private sector cooperation in industrial pollution control can be showcased and the benefits from joint efforts maximized.

However, because MEPZ is located in an urbanized area that is also developed for other purposes, such as tourism, residential and

TABLE 15. BOI-Registered Manufacturing Projects in Metro Cebu, by Industry Group and Industrial Incentives Legislation, 1975–1996

PSIC Code	Industry Group	RA 6135 (1967)	RA 6135 (1970)	PD 1789 (1981)	BP 391 (1983)	ED 226 (1987)	No Data	Total
311 & 312	Food	1	3	7	10	33	–	33
313	Beverages	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–
321	Textile	–	–	1	1	7	–	7
322	Wearing apparel except footwear	–	2	2	–	7	–	7
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	–	–	1	–	1
324	Footwear, except rubber, plastic or wood furniture	–	1	–	–	1	–	1
331	Wood, wood and cork products, except furniture	–	–	–	2	11	–	11
332	Furniture and fixtures, except primarily of metal (including repairs)	–	10	12	24	38	1	39
341	Paper and paper products	–	–	–	–	4	–	4
342	Printing, publishing and allied industries	–	–	–	1	–	–	0
351	Industrial chemicals	–	–	–	–	3	–	3
352	Other chemical products	–	2	–	–	6	–	6
353	Petroleum refineries	–	–	–	–	1	–	1
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–
355	Rubber products	–	–	–	–	–	–	–
356	Plastic products, n.e.c.	–	–	–	–	6	–	6
361	Pottery, china and earthenware	–	–	–	–	2	–	2
362	Glass and glass products	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–

Table 15: Continued

369	Other non-metallic mineral products	–	–	–	3	17	–	17
371	Iron and steel basic industries	2	–	–	–	2	–	2
372	Non-ferrous metal basic industries	–	–	–	–	–	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	1	–	–	–	6	–	6
382	Machinery except electrical	–	–	–	1	2	–	2
383	Electrical machinery, apparatus, appliances and supplies	–	1	–	–	2	–	2
384	Transport equipment	1	–	–	–	2	–	2
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	–	–	–	–	1	–	1
386	Furniture and fixtures primarily of metal (including repairs)	–	–	–	–	8	–	8
390	Other industries	–	–	–	2	8	–	8
400	Mixed industries		4	1	11	43	–	43
	TOTAL	**5**	**23**	**23**	**55**	**211**	**1**	**318**
	Cumulative total	5	28	51	106	317	318	
	Growth rate (%)	–	460.00	82.14	107.84	199.06		
	Average growth rate					169.81		

Source of basic data: BOI, Makati office data files.

TABLE 16. BOI-Registered Manufacturing Projects in Metro Cebu, By Industry Group and Nationality of Owner, 1975-1996

PSIC Code	Industry Group	Nationality of Owner							
		Full Filipino	Full American	Full Japanese	Full South Korean	Filipino-Foreign	Others	No Data	Total
311 & 312	Food	24	–	–	–	8	–	22	54
313	Beverages	–	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–	–
321	Textile	2	–	–	–	4	–	3	9
322	Wearing apparel except footwear	6	–	–	–	2	–	3	11
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	–	–	–	–	–	1	1
324	Footwear, except rubber, plastic or wood footwear	1	–	–	–	1	–	–	2
331	Wood, wood and cork products, except furniture	5	–	–	–	4	–	4	13
332	Furniture and fixtures, except primarily of metal (including repairs)	33	–	–	–	8	–	44	85
341	Paper and paper products	3	–	–	–	1	–	–	4
342	Printing, publishing and allied industries	–	–	–	–	–	–	–	–
351	Industrial chemicals	3	–	–	–	–	–	–	3
352	Other chemical products	1	–	–	–	3	1	4	9
353	Petroleum refineries	–	–	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–	–
355	Rubber products	–	–	–	–	1	–	–	1

Table 16: Continued

356	Plastic products, n.e.c.	2	–	–	–	3	–	1	6
361	Pottery, china and earthenware	1	–	–	–	1	–	–	2
362	Glass and glass products	–	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–	–
369	Other non-metallic mineral products	9	–	–	–	4	1	6	20
371	Iron and steel basic industries	2	–	–	–	1	–	1	4
372	Non-ferrous metal basic industries	–	–	–	–	–	–	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	4	–	–	–	2	–	1	7
382	Machinery except electrical	1	–	–	–	1	–	1	3
383	Electrical machinery, apparatus, appliances and supplies	–	–	–	–	1	–	2	3
384	Transport equipment	1	–	–	–	1	–	1	3
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	1	–	–	–	–	–	–	1
386	Furniture and fixtures primarily of metal (including repairs)	6	–	–	–	–	–	2	8
390	Other industries	2	–	2	–	3	–	3	10
400	Mixed industries	21	1	–	1	19	–	17	59
	TOTAL	**128**	**1**	**2**	**1**	**68**	**2**	**116**	**318**
	% to total	40.25	0.31	0.63	0.31	21.38	0.63	36.48	100.00

Source of basic data: BOI, Makati office data files.

TABLE 17. Manufacturing Firms in the MEPZ, By Industry Group and Ownership, 1996

PSIC Code	Industry Group	OWNERSHIP						TOTAL
		Filipino	Japanese	American	Italian	Taiwanese	Others	
311 & 312	Food	1	1	–	–	–	–	2
313	Beverages	–	–	–	–	–	–	–
314	Tobacco	–	–	–	–	–	–	–
321	Textile	–	–	–	–	–	–	
322	Wearing apparel except footwear	5	12	–	–	1	1	19
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	–	1	–	–	1	3
324	Footwear, except rubber, plastic or wood footwear	–	–	–	–	–	–	–
331	Wood, wood and cork products, except furniture	–	–	–	1	–	–	1
332	Furniture and fixtures, except primarily of metal (including repairs)	–	–	–	–	–	–	–
341	Paper and paper products	–	1	–	–	–	–	1
342	Printing, publishing and allied industries		1	–	–	–	–	1
351	Industrial chemicals	2	–	–	–	–	–	2
352	Other chemical products	–	–	–	–	–	–	–
353	Petroleum refineries	–	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–
355	Rubber products	–	–	–	–	–	–	–

Table 17: Continued

356	Plastic products, n.e.c.	–	3	–	–	–	–	3
361	Pottery, china and earthenware	–	–	–	–	–	–	–
362	Glass and glass products	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–
369	Other non-metallic mineral products	–	–	–	–	–	–	–
371	Iron and steel basic industries	–	4	–	–	–	–	4
372	Non-ferrous metal basic industries	–	1	1	–	–	–	2
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	–	4	–	–	–	–	4
382	Machinery except electrical	3	3	–	–	–	1	7
383	Electrical machinery, apparatus, appliances and supplies	–	7	1	–	–	2	10
384	Transport equipment	–	2	1	–	–	–	3
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	–	8	–	–	–	1	9
386	Furniture and fixtures primarily of metal (including repairs)	–	–	–	–	–	–	–
390	Other industries	1	5	–	–	–	–	6
400	Mixed industries	2	7	–	–	2	2	13
	TOTAL	**15**	**69**	**4**	**1**	**3**	**8**	**90**
	% to total	16.67	65.56	4.44	1.11	3.33	8.89	100.00

Source of basic data: MEPZ office data files.

services, it can have adverse impacts. As the MEPZ grows, it will certainly produce more and more wastes. Without proper control, these wastes will compromise beaches and the general ambience and standards in surrounding areas.

Table 18. Economic Performance of Export Processing Zones, 1994–1995

	% Accomplishment of Target	
	1994	1995*
Exports		
Bataan	88.84	75.04
Baguio	131.13	108.50
Mactan	104.84	84.10
Cavite	82.47	84.96
Employment		
Bataan	98.42	113.48
Baguio	99.15	97.25
Mactan	123.10	87.44
Cavite	118.30	97.08
Net Trade Balance		
Bataan	143.89	99.32
Baguio	49.55	35.35
Mactan	272.67	204.89
Cavite	104.64	122.80

* First 10 months of 1995.

Source: PEZA as lifted from Terosa, (1995).

ASSESSMENT OF THE IMPACTS OF ENVIRONMENT POLICY

Background of the national pollution control policy

Several laws addressing industrial pollution have been promulgated as early as the 1960s. A complete listing of the major legislations on pollution control is contained in IEMP (1995), while a review of the laws is provided by Oposa (1996).

The main legislation dealing on air and water pollution is P.D. 984, or the National Pollution Control Decree of 1976, as amended by E.O. 192 of 1987. This law stipulates as national policy the prevention, abatement and control of pollution. Its implementing rules and

regulations are given in Department of Environment and Natural Resources (DENR) Department Administrative Order (DAO) No. 34 and 35, which established the air and water quality standards to be adhered to by polluting industries.

Another piece of legislation relevant to industry is P.D. 1586 of 1978, which established the Environmental Impact Statement (EIS) system in the Philippines. Still another important legislation is R.A. 6969, or the Toxic Substances and Hazardous Wastes Control Act of 1990, which regulates the production, use and trade of toxic and hazardous wastes.

Environmental Impact Statement system

Management of the EIS system

Before a firm can operate, it has to comply with the EIS system. The main requirement under the system is for a firm to get an Environmental Clearance Certificate (ECC) from the DENR.

The management of the EIS system in general, and of the ECC in particular, is handled by the Environmental Impact Assessment Division (EIAD) of the DENR. In the CVR, the EIAD is an ad hoc division that does not have a separate budget. Moreover, it has serious constraints on financial and manpower resources in relation to the large number of firms it is handling. At present, partially to address operational problems, the EIAD is merged with another division, the Environmental Quality Division (EQD), under one head.

Implementation of the ECC requirement

The DENR has required all industrial firms to acquire an ECC in light of nationwide efforts to expand the EIS system coverage to all development projects.

Available data as of 1995 show that only a small portion of the operating firms have ECCs (Table 19). Of the total BOI/MEPZ firms, only 16 percent have ECCs.[7] The industry groups with the highest percentage of ECCs are the manufacturing of transport equipment, metal basic industries, iron and steel basic industries, electrical machinery and wearing apparel.

7. In the case of DENR data, the BOI establishments are now classified in terms of firms and not projects, thus, the shift from the earlier treatment of BOI establishments.

TABLE 19. Manufacturing Establishments in Metro Cebu, by Issuance of Environmental Clearance Certificate, 1995

PSIC Code	Industry Group	BOI / MEPZ			Non-BOI Non-MEPZ	Total with ECC
		Issued ECC	Total Operating	% to Total		
311 & 312	Food	4	41	9.76	48	52
313	Beverages	–	–	–	1	1
314	Tobacco	–	–	–	–	–
321	Textile	1	7	14.29	–	1
322	Wearing apparel except footwear	10	25	40.00	–	10
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	3	33.33	–	1
324	Footwear, except rubber, plastic or wood footwear	–	1	0.00	–	–
331	Wood, wood and cork products, except furniture	–	8	0.00	13	13
332	Furniture and fixtures, except primarily of metal (incluidng repairs)	1	69	1.45	24	25
341	Paper and paper products	1	4	25.00	·	1
342	Printing, publishing and allied industries	–	1	0.00	·	–
351	Industrial chemicals	1	5	20.00	3	4
352	Other chemical products	–	6	0.00	2	2
353	Petroleum refineries	–	–	–	–	
354	Miscellaneous products of petroleum and coal	–	–	–	–	–
355	Rubber products	–	–		11	11
356	Plastic products, n.e.c.	1	6	16.67	4	5

Table 19: Continued

361	Pottery, china and earthenware	–	1	0.00	–	–
362	Glass and glass products	–	–	–	–	–
363	Cement	–	–	–	14	14
369	Other non-metallic mineral products	–	14	0.00	5	5
371	Iron and steel basic industries	2	5	40.00	4	6
372	Non-ferrous metal basic industries	1	2	50.00	6	7
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	3	9	33.33	–	3
382	Machinery except electrical	1	10	10.00	–	1
383	Electrical machinery, apparatus, appliances and supplies	4	10	40.00	2	6
384	Transport equipment	5	6	83.33	3	8
385	Professional and scientific and measuring and controlling equipment, n.e.c., and photographic and optical instrument	1	10	10.00	–	1
386	Furniture and fixtures primarily of metal (including repairs)	–	6	0.00	1	1
390	Other industries	5	14	35.71	3	8
400	Mixed industries	10	60	16.67	9	19
	TOTAL	**52**	**323**	**16.10**	**153**	**205**

Source of basic data: DENR Region VII, EIAD Files.

There are non-BOI/non-MEPZ firms which have ECCs, although it is not known how many these are in terms of percentage to the total. All in all, 205 firms have ECCs. It is noted that the food and furniture industries, which have a large number of SMEs, are among the groups with the lowest percentage of ECCs.

The reasons put forward by the authorities for firms not having an ECC are mainly related to the conduct of the Environmental Impact Assessment (EIA) study, the main basis for its granting. Either the firms are still in the process of conducting the study, the study has been submitted to the DENR but was found inadequate and thus returned, or the study has been submitted but was not yet acted on due to non-compliance of other administrative requirements.

Reasons were also put forward by some firms on why they take time to submit an EIA study. These include the technical and time-consuming nature of the study, lack of financial capability especially among SMEs to seek consultancy assistance in study preparation, difficulty of putting up a study for a plant that has already been in existence, and lack of knowledge of the existing environmental regulations.

The DENR has been penalizing firms which are intentionally disregarding the regulation and are operating without an ECC. In 1995, 15 manufacturing firms were meted fines for ECC violation. Most of them are located in Mandaue City and Lapu-Lapu City (Table 20). This number, however, is insignificant in relation to the total number of manufacturing firms in Metro Cebu without ECCs.

TABLE 20. Manufacturing Establishments in Metro Cebu Imposed an ECC Fine for Non-Compliance, 1995

Location	No. of Manufacturing Firms		
	Imposed and Paid Fine	Imposed but Fine Still Unsettled	Total
Cebu City	–	–	–
Mandaue City	6	1	7
Lapu-Lapu City	2	5	7
Talisay	–	–	–
Consolacion	–	1	1
TOTAL	**8**	**7**	**15**
% to total	53.33	46.67	100.00

Source of basic data: DENR Region VII, EIAD files.

More than half of the firms meted fines have paid. Some firms, however, through negotations, were able to reduce their fines, sometimes to even as low as a fifth of the maximum amount. There have been recent initiatives and suggestions at the national level to improve compliance among firms (e.g., Oposa 1996; IEMP 1995). Among the initiatives put forward was the raising of the penalty fee for those without an ECC.

Another recent development which may have relevance in Metro Cebu is the issuance of DENR DAO No. 11 of 1992, which allows the use of the programmatic EIA. This approach applies a common environmental assessment for a congregated development area such as industrial estates and zones. The use of the programmatic EIA is expected to reduce greatly the cost associated with EIA compliance and improve pollution management in a common area. At present, the approach is pilot-tested and, if proven effective, will be applied to future industrial zones and similar sites.

Implementation of other requirements

Aside from the ECC, the DENR requires additional permits, the Authority to Construct (AC) and the Permit to Operate (PO), before firms can operate. The AC is a permit for the construction of pollution-related facilities, a Wastewater Treatment Facility (WTF) or Air Pollution Control Device (APCD).

In 1995, 73 manufactuting firms were meted fines for not complying with administrative regulations, including the AC and PO (Table 21). Most of the firms were located in the three cities, notably Mandaue City. These figures and those on ECC violations imply that a significant number of manufacturing firms does not comply with pre-operation environmental regulations.

Water and air standards

Management of the standards

The implementation of water and air quality standards during the operational stage of the firms falls in the hands of the EQD of the DENR. Unlike the EIAD, the EQD is a regular division which has a separate budget. However, it also faces severe financial and resource constraints given the large and increasing number of industrial firms it services in the CVR.

TABLE 21. Manufacturing Establishments in Metro Cebu Imposed Administrative Fines* for Non-Compliance, 1995

Location	No. of Manufacturing Firms
Cebu City	11
Mandaue City	43
Lapu-Lapu City	12
Talisay	5
Consolacion	2
TOTAL	**73**

* Administrative fines are imposed for non-compliance of AC, PO and other administrative requirements. All the fines above have already been paid for by the firms.
Source of basic data: DENR Region VII, revenue generation files.

Monitoring of environmental quality

As in other regions, industrial environmental quality monitoring in the CVR is done by the EQD in collaboration with Pollution Control Officers (PCOs) hired by the firms and accredited by the DENR. Only a few (about 19 percent) of the BOI/MEPZ firms, however, have certified PCOs (Table 22). In terms of percentage, the industry groups with the most PCOs are the manufacturing of pottery, transport equipment, non-ferrous metal basic industries, and professional equipment. All in all, 107 firms have PCOs. Again, the food and furniture manufacturing industries are among the groups which have a low percentage of PCOs.

In actual monitoring, the EQD periodically visits the firms while the PCOs do the regular monitoring and submit quarterly reports to the agency. Because of this arrangement, the main responsibility of environmental quality monitoring within firms lies in the hands of the PCOs. This situation may lead to potential problems. Full veracity of reports, for instance, cannot be assured as PCOs are expected to be more beholden to their companies than to the government whenever conflicts of interest arise.

Another problem in monitoring is the inadequacy of laboratory services in Metro Cebu. At present, the laboratory of the DENR is hard pressed to meet the demand for services both from the public and the private sector. The latter, in particular, has been growing rapidly due to the increase in the number of firms, especially SMEs, which do not have their own laboratory facilities.

Implementation of the WTF requirements

In Metro Cebu, manufacturing firms which produce wastewater that can potentially exceed standards are required to establish a WTF. About 4 percent of BOI/MEPZ firms and 30 other firms have WTFs (Table 23). Percentage wise, most of the BOI/MEPZ firms with the facility belong to the chemical products, fabricated metal products, and other manufacturing subsectors. Since the WTF is a requirement, it follows that these subsectors may be the most problematic manufacturing groups in terms of wastewater generation.

In most of the firms with WTFs, the facilities are capable of doing both primary and secondary treatment. Only a few firms have WTFs that can handle only primary treatment. The ability to conduct treatment up to the secondary level indicates the relatively higher level of sophistication with which firms in Metro Cebu handle their wastewater.

Within MEPZ, only a few firms have WTFs. This may signal a potential problem in the environmental management of the zone. The MEPZ at present neither has a common WTF nor a zone PCO. The only provisions it has are sewage lines that serve as wastewater conduits from the plants to the sea. With only a few firms doing water treatment in the zone, it is likely that a large percentage of the wastewater that passes through the sewage lines is untreated.

Implementation of the APCD requirements

As in the case of wastewater, a firm which emits air pollution that potentially exceeds government standards is required to put up an APCD. About 37 percent of BOI/MEPZ firms and 182 of the other firms have APCDs (Table 24). Percentage wise, the groups with the most APCDs are the manufacturing of pottery, fabricated metal products, furniture, electrical machinery, transport equipment, and food. It follows that these may be the subsectors which are the most problematic in terms of industrial air pollution.

Comparatively, it appears that air pollution control receives relatively more attention among firms than water pollution. A reason for this may be that the APCDs are much cheaper to install than the WTFs. In addition, since air pollution can directly affect the health and well-being of firm personnel and their productivity, it is to the self-serving interest of the firms that they address the problem.

TABLE 22. Manufacturing Establishments in Metro Cebu, By Presence of Certified Pollution Control Officer, 1995

PSIC Code	Industry Group	BOI / MEPZ			Non-BOI Non-MEPZ	Total with PCO
		With PCO	Total Operating	% to Total		
311 & 312	Food	5	41	12.20	11	16
313	Beverages	–	–	–	3	3
314	Tobacco	–	–	–	–	–
321	Textile	2	7	28.57	–	2
322	Wearing apparel except footwear	1	25	4.00	–	1
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	3	33.33	–	1
324	Footwear, except rubber, plastic or wood footwear	–	1	0.00	–	–
331	Wood, wood and cork products, except furniture	1	8	12.50	3	4
332	Furniture and fixtures, except primarily of metal (including repairs)	18	69	26.09	7	25
341	Paper and paper products	–	4	0.00	1	1
342	Printing, publishing and allied industries	–	1	0.00	–	–
351	Industrial chemicals	–	5	0.00	2	2
352	Other chemical products	1	6	16.67	1	2
353	Petroleum refineries	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–
355	Rubber products	–	–	–	3	3
356	Plastic products	1	6	16.67	3	4
361	Pottery, china and earthenware	1	1	100.00	–	1

Table 22: Continued

362	Glass and glass products	–	–	–	–	–
363	Cement	–	–	–	–	–
369	Other non-metallic mineral products	2	14	14.29	2	4
371	Iron and steel basic industries	1	5	20.00	2	3
372	Non-ferrous metal basic industries	1	2	50.00	–	1
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	1	9	11.11	1	2
382	Machinery except electrical	2	10	20.00	–	2
383	Electrical machinery, apparatus, appliances and supplies	4	10	40.00	1	5
384	Transport equipment	3	6	50.00	1	4
385	Professional and scientific and measuring and controlling equipment, n.e.c., and photographic and optical instrument	4	10	40.00	–	4
386	Furniture and fixtures primarily of metal (including repairs)	–	6	0.00	–	–
390	Other industries	5	14	35.71	–	5
400	Mixed industries	7	60	11.67	4	11
	TOTAL	**61**	**323**	**18.89**	**45**	**106**

Source of basic data: DENR Region VII, EIAD files.

TABLE 23. Manufacturing Establishments in Metro Cebu, By Type of Water Treatment Facility, 1995

PSIC Code	Industry Group	BOI / MEPZ			Non-BOI / Non-MEPZ	Total with WTF	Type of WTF		
		With WTF	Total Operating	% to Total			Primary Treatment	Secondary Treatment	Tertiary Treatment
311 & 312	Food	3	41	7.32	15	18	18	18	1
313	Beverages	–	–	–	2	2	2	2	–
314	Tobacco	–	–	–	–	–	–	–	–
321	Textile	–	7	0.00	–	–	–	–	–
322	Wearing apparel except footwear	1	25	4.00	–	1	1	1	–
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	–	3	0.00	–	-	–	–	–
324	Footwear, except rubber, plastic or wood footwear	–	1	0.00	–	–	–	–	–
331	Wood, wood and cork products except furniture	–	8	0.00	1	1	1	1	–
332	Furniture and fixtures, except primarily of metal	–	69	0.00	–	–	–	–	–
341	Paper and paper products	–	4	0.00	–	–	–	–	–
342	Printing, publishing and allied industries	–	1	0.00	–	–	–	–	–
351	Industrial chemicals	–	5	0.00	2	2	2	1	–
352	Other chemical products	1	6	16.67	–	1	1	1	–
353	Petroleum refineries	–	–	–	–	–	–	–	–
354	Miscellaneous products of petroleum and coal	–	–	–	–	–	–	–	–

Table 23: Continued

355	Rubber products	–	–	–	–	–	–	–	–
356	Plastic products	–	6	0.00	–	–	–	–	–
361	Pottery, china and earthenware	–	1	0.00	–	–	–	–	–
362	Glass and glass products	–	–	–	–	–	–	–	–
363	Cement	–	–	–	–	–	–	–	–
369	Other non-metallic mineral products	1	14	7.14	5	6	6	–	–
371	Iron and steel basic industries	–	5	0.00	1	1	1	1	–
372	Non-ferrous metal basic industries	–	2	0.00	–	–	–	–	–
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	1	9	11.11	–	1	1	–	–
382	Machinery except electrical	–	10	0.00	–	–	–	–	–
383	Electrical machinery, apparatus, appliances and supplies	1	10	10.00	–	1	1	–	–
384	Transport equipment	–	6	0.00	1	1	1	–	–
385	Professional and scientific and measuring and controlling equipment n.e.c., and photographic and optical instrument	–	10	0.00	–	–	–	–	–
386	Furniture and fixtures primarily of metal (including repairs)	–	6	0.00	–	–	–	–	–
390	Other industries	3	14	21.43	–	3	2	1	–
400	Mixed industries	2	60	3.33	3	5	3	1	–
	TOTAL	**13**	**323**	**4.02**	**30**	**43**	**40**	**27**	**1**

Source of basic data: DENR Region VII, EIAD files.

TABLE 24. Manufacturing Establishments in Metro Cebu, by Type of Air Pollution Control Device, 1995

PSIC Code	Industry Group	BOI / MEPZ			Non-BOI Non-MEPZ	Total with APCD
		With APCD	Total Operating	% to Total		
311 & 312	Food	20	41	48.78	50	70
313	Beverages	1	–	0.00	–	1
314	Tobacco	–	–	–	–	–
321	Textile	1	7	14.29	–	1
322	Wearing apparel except footwear	1	25	4.00	–	1
323	Leather and leather products, leather substitutes and furs, except footwear and wearing apparel	1	3	33.33	–	1
324	Footwear except rubber, plastic or wood footwear	–	1	0.00	1	1
331	Wood, wood and cork products except furniture	3	8	37.50	21	24
332	Furniture and fixtures, except primarily of metal (including repairs)	39	69	56.52	38	77
341	Paper and paper products	1	4	0.00	1	2
342	Printing, publishing and allied industries	–	1	0.00	–	–
351	Industrial chemicals	1	5	0.00	2	3
352	Other chemical products	–	6	0.00	2	2
353	Petroleum refineries	–	–	–	–	–

Table 24: Continued

354	Miscellaneous products of petroleum and coal	–	–	–	–	–
355	Rubber products	–	–	–	11	11
356	Plastic products, n.e.c.	1	6	16.67	–	1
361	Pottery, china and earthenware	1	1	100.00	–	1
362	Glass and glass products	–	–	–	–	–
363	Cement	–	–	–	–	–
369	Other non-metallic mineral products	6	14	42.86	20	26
371	Iron and steel basic industries	–	5	0.00	8	8
372	Non-ferrous metal basic industries	–	2	0.00	4	4
381	Fabricated metal products, except machinery and equipment, furniture and fixtures primarily of metal	8	9	88.89	3	11
382	Machinery except electrical	–	10	0.00	–	–
383	Electrical machinery, apparatus, appliances and supplies	6	10	60.00	1	7
384	Transport equipment	3	6	50.00	4	7
385	Professional and scientific and measuring and controlling equipment, n.e.c. and photographic and optical instrument	4	10	40.00	–	4
386	Furniture and fixtures primarily of metal (including repairs)	–	6	0.00	–	–
390	Other industries	6	14	42.86	3	9
400	Mixed industries	16	60	26.67	13	29
	TOTAL	**119**	**323**	**36.84**	**182**	**301**

Source of basic data: DENR Region VII, EQD files.

Waste handling and disposal

Currently, there are no data available on waste handling and disposal. However, the practices for the handling and disposal of industrial wastes are known and similar across manufacturing firms. For both treated and untreated wastewater, the disposal is usually done by draining the water into the drainage systems either constructed by the firms or by the government (in the case of MEPZ). Eventually, these wastes flow into canals, river systems and the sea.

For sludge and chemical wastes which are hazardous/toxic, the procedure for handling followed among firms are similar. The wastes are usually stored in drums and other durable containers and placed in safehouses within plant sites. In general, the drums are kept above ground instead of buried. It is not known what plans the firms have to dispose these stored wastes over the long-term or when they close shop.

There have been reports that the handling of hazardous/toxic wastes among small firms is not as organized as among big firms. In some cases, wastes may have been carelessly stored in open containers which eventually resulted in ground spillage. In other cases, wastes may have been thrown directly into the ground or even water bodies, (see, e.g., Ricana 1992).

Violations of water and air quality standards

There are no tabulated records on the number of manufacturing firms which violated water or air quality standards and were either asked to upgrade their treatment and control facilities or imposed penalties. Furthermore, the available data on violating firms which were imposed a Cease and Desist Order (CDO) were only for the period starting 1995.

Since 1995 until June 1996, only five manufacturing firms in Metro Cebu were imposed a CDO (Table 25). Two were furniture manufacturing firms which violated air quality standards while three were food manufacturing firms which failed water quality standards. Four of the firms are located in Mandaue City while one is in Cebu City. No manufacturing firm located in MEPZ has been imposed a CDO so far.

For the concerned firms, the imposed CDOs either took effect only for a short period or were unable to close down the violating firm. Firms which were closed down reopened as soon as they obtained a Temporary Restraining Order (TRO). One firm was issued a CDO in June 1996 but remains operating up to the present because the owner has filed a motion for reconsideration.

TABLE 25. DENR-Monitored Manufacturing Establishments in Metro Cebu Imposed a CDO, January 1995-June 1996

Type and No. of Firm	Location	Violation	CDO Extension Date	Comments
Furniture Manufacturing Firm (1)	Cebu City	Air Pollution	Issued a CDO-PAB Resolution Date: 6/18/96	Firm is still operating at present as the owner filed a motion for reconsideration.
Food Manufacturing Firm (1)	Mandaue City	Water Pollution	Issued a CDO-PAB Resolution Date: 10/13/95	Temporary Restraining Order (TRO) issued on 11/20/95.
Food Manufacturing Firm (1)	Mandaue City	Water Pollution	Issued a CDO-PAB Resolution Date: 9/7/95	Temporary Restraining Order (TRO) issued on 9/13/95.
Furniture Manufacturing Firm (1)	Mandaue City	Air Pollution	Reimposed a CDO-PAB Resolution dated 5/19/95	Temporary Restraining Order (TRO) issued (Date unknown).
Food Manufacturing Firm (1)	Mandaue City	Water Pollution	Reimposed a CDO-PAB Resolution dated 2/28/95	Temporary Restraining Order (TRO) issued on 4/11/95.

Source: DENR Region VII (various dates). "Pollution Adjudication Board Cases Status Monitoring Report."

It has been reported that the imposition of CDOs as a deterrent against firms violating environmental quality standards has been weakened by structural weaknesses in the system. These structural weaknesses allow many firms to draw out the process, e.g., delay the imposition of a CDO by contesting it. In Metro Cebu, the above problem is exacerbated by the fact that the legal arm of the DENR is greatly limited. At present, the agency only has two lawyers to attend to the legal aspects of the implementation of regulations. Although positions are available, there has been a dearth in qualified applicants because of the non-competitive salaries of offered positions.

Non-regulatory environmental initiatives in the manufacturing sector

In addition to the regulatory instruments, there have been recent initiatives for industrial pollution control in Metro Cebu. For instance, the DENR, with the aid of international donor organizations, have been undertaking projects that address industrial pollution. These projects are the USAID-funded IEMP and the German government funded PGP-IPCC.

The EIMP is a nationwide project which started in 1992 and will terminate in 1996. Its objective is to create broadly-based partnership between sectors that will encourage sustained industrial growth and at the same time reduce pollution and environment-related health problems (see PRCEMI 1996). On the other hand, the PGP-IPCC is a Cebu-specific project that aims to promote industrial pollution control with a view to create a mechanism for the environment-friendly disposal and management of toxic and hazardous waste from industry and trade. It has an original timetable of five years, with the first phase conducted in 1991-1993 and the second phase in 1993–1996.

Sectorally, the PGP-IPCC has been concentrating its efforts on the electroplating industry because it was found to be the most environment-unfriendly. Electroplating serves the needs of various industries, including the manufacturing of electronics, furniture, fashion accessories and other activities. The PGP-IPCC will be establishing a common industrial waste treatment facility in Metro Cebu which will eventually service not only the electroplaters but also other waste producing industries (see, e.g., PGP-IPCC 1995c, 1995d). At present, the plans for the plant are already completed and a site has been located in Mandaue City.

For its part, the IEMP runs a Pollution Management Approval (PMA) activity nationwide for providing technical assistance and advice to

firms on waste reduction and pollution control. The PMA now covers more than 130 volunteer industrial firms throughout the country, including 17 firms in Cebu province. Of the firms in the provinces, 11 are manufacturing firms located in the Metro Cebu area.

It is observed that while the two projects have been a significant help in the efforts to contain industrial pollution in Metro Cebu, their coverage have been quite limited. There is the need to expand these projects or establish new projects that have a wider scope.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

To recapitulate, this paper investigates the impacts of the industrial policies of export, investment and regional dispersion promotion on the manufacturing sector, and the interactions between the environmental policy of industrial pollution control and the manufacturing sector, using Metro Cebu as case study. It uses secondary data gathered from government agencies, private organizations and other sources, and primary data solicited through personal interviews with key informants.

The review of Metro Cebu shows that the region is one of the most economically progressive in the country. It has a fast rising population which, coupled with the narrow coastal location, has led to congestion in city centers. The profile of the manufacturing sector indicates that it has been growing rapidly but is concentrated in the cities. Environmentally, the congestion of both population and industries in cities highlights the potential great risk that industrial pollution poses to human health and welfare.

The pollution profile shows that Metro Cebu faces serious air and water pollution problems. It also indicates that several of the industry groups, including those which have substantial SME composition, are potentially pollutive and/or hazardous. In environmental terms, this situation brings out an important issue: how to undertake pollution control among firms which may not have the resources to finance it.

The analysis of the impacts of the industrial policies on the manufacturing sector shows that, in general, the policies have been successful in promoting industrial growth. Success, however, is hampered by the concomitant rise of industries which are potentially

pollutive and/or hazardous. This implies that increased industrial pollution may be an unwanted consequence of industrial policies.

In terms of specific policies, the study found that the easing of trade restrictions over time resulted in the growth of an export-oriented manufacturing sector. Again, however, this growth includes potentially pollutive and/or hazardous exporting firms. Thus, a major trade and environment issue arises: how the environment-related international trade agreements and standards will influence the growth of the export-oriented manufacturing sector in the years ahead.

As in the case of trade policy, investment policy was found to be successful in promoting foreign and domestic investment. Environmentally, the influx of foreign firms may be favorable as they may have access to advanced technology and financial resources for pollution management. On the other hand, the growth of local firms open up conflicting possibilities and, thus, their likely impacts on pollution management are difficult to predict.

The policy of regional dispersal likewise was found successful, as manifested by the favorable performance of the export zone. In terms of positive impacts on the environment, the contiguous zone allows easier cooperation in environmental management. On the downside, the location of MEPZ close to residential, tourism and service centers makes it a threat to the maintenance of acceptable environmental standards in these sensitive areas.

On the impacts of the national policy of industrial pollution control on the manufacturing sector, the study found that at varying stages of implementation of the regulatory measures, some administrative problems have been encountered. Among others, at the pre-operation stage, the division administering the EIS system is an ad hoc unit that has no separate budget yet tasked to deal with a large and growing number of firms. Furthermore, many firms may have been unable to comply with the ECC and other administrative requirements for various reasons, both valid and otherwise.

Problems were also identified in the implementation of pollution control regulations during the operation stage. In particular, although the division tasked to implement environmental quality standards is a regular division with its own budget, it is faced with severe financial constraints. In particular, the inadequacy of laboratory services in the division to meet growing demands from industries is a pressing problem.

In terms of pollution control facilities, the study found that some manufacturing firms in Metro Cebu already have WTFs and most are

capable of doing both primary and secondary treatment. In the MEPZ, however, only a few firms have WTFs and the zone does not have a PCO or specific pollution control unit to address environmental concerns.

The study also found that some firms already have APCDs. These facilities, however, do not ensure that air pollution is no longer a problem in industrial sites. This is because, as the devices are installed on a term-basis, individual pollution emissions may be low although cumulative emissions remain high, posing continued danger to nearby residents.

In the case of waste handling and disposal, the study found that untreated wastewater is usually disposed by firms into drainage systems which eventually lead to the sea while hazardous and/or toxic wastes are stored in containers and placed in safehouses. The disposal of untreated wastewater and toxic and/or hazardous wastes into waterways is a major problem because this will damage the marine environment. Furthermore, looking for a viable permanent site for the container-stored wastes must be addressed.

The study also found that there were problems in the implementation of air and quality standards. The few CDOs imposed took effect only a short time or were ineffective in closing down violating firms. In general, the use of the CDO as deterrent has been weakened by structural weaknesses that allow firms to draw out the process. Furthermore, the legal arm of the DENR to pursue cases related to violations is greatly hindered by its limited manpower and resources.

Finally, the study found that there are internationally funded projects ongoing on industrial pollution in Metro Cebu. These, however, either concentrate only on an industry group or have limited coverage. Thus, there remains the work of expanding the activities of the projects or putting up new and longer projects.

In summary, this case study found that industrial policies have been successful in promoting industrial development in Metro Cebu although they may have also led to the proliferation of potentially pollutive and/or hazardous firms. The policy of industrial pollution control has been implemented across firms but administrative and resource-related problems were encountered which hinder success.

Recommendations

The study suggests the following measures to address the problems related to the implementation of pollution regulations in Metro Cebu:

a. Transformation of the EIAD division of the regional DENR from an ad hoc to a regular division. This new division must be given a separate budget and staffed with adequate and competent personnel to cope with its growing workload and responsibilities.
b. Streamlining of the EIS system, EIA study and other administrative requirements. The system must be modified, i.e., along the lines suggested by the IEMP (1995) and Oposa (1996). Also, the integration and simplification of the AC and PO into just one requirement must be considered.
c. Strengthening the EQD of the regional DENR. At present, this division suffers from resource constraints, especially given the magnitude of its monitoring and other tasks. Its staff and budget must be enhanced proportional to the increasing number of its client firms.
d. Enhancement of the legal arm of DENR. Action in this area is critical as the success in the implementation of regulations depend largely on the number of court cases won against erring firms. There is the need to study ways to enhance the number of quality lawyers in the DENR.
e. Requirement of a zone-wide PCO and environmental management office for MEPZ. This action will enhance pollution control at the inter-firm and zone-wide levels.
f. Conduct of a study and plan for the long-term handling and disposal of toxic wastes produced by firms. Over time, the volume of stockpiled toxic wastes by firms will certainly rise. In the end, the necessity of finding a permanent and safe storage site for these wastes will be unavoidable.
g. Conduct of programmatic EIAs in industrial zones. This is an option that must be seriously considered for future industrial zones. For the current MEPZ, preparation of a post-establishment programmatic EIA can be done by the new environmental management unit to be established in the zone.
h. Granting of financial assistance to SMEs for the establishment of waste reducing and treating equipment. For instance, support for the development of waste reducing technology should concentrate not only on the electroplating industry but on other groups as well.
i. Conduct of an environmental profile for the industrial sector in Metro Cebu. Lack of comprehensive data is a con-

straining factor in the environmental planning and management of the area. This problem can be addressed by conducting an environmental profile which will generate and consolidate both primary and secondary data.

j. Study of the use of market-based instruments in tandem with regulatory instruments. As mentioned, pollution control in the Philippines has been centered on the use of regulatory instruments. The theoretical and empirical development in recent years point to the validity of market-based instruments as potentially effective measures for pollution control. The use of at least some of these instruments must be contemplated for Metro Cebu.

k. Study of the impacts of international environmental agreements and standards. These agreements and standards will likely impact on the international trade situation of Metro Cebu given the potentially pollutive/hazardous nature of some of the exporting industries in the area.

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